LISTING OF THE CLAIMS

1-28.   (canceled).

29.   (previously presented) A machine-implemented method, comprising:

receiving a multimedia signal having data values;

forming the data values into a matrix of inputs [X];

forming a matrix [A] of predetermined values and multiplication operations;

factoring [A] into a butterfly matrix [B], a shuffle matrix [S], and a multiplication matrix [M], wherein the multiplication operations are selectively positioned into pairs within [M]; and

executing a Single Instruction Multiple Data (SIMD) instruction that multiplies [X], [B], [S], and [M] together to obtain a matrix of outputs [Y].

30.   (Previously Presented) The machine-implemented method of claim 29, wherein the SIMD instruction is a Packed Multiply and Add (PMADDWD) instruction.

31.   (Previously Presented) The machine-implemented method of 30, wherein values within [B] and [S] are integers selected from the group consisting of 1, 0 and −1.

32.   (Previously Presented) The machine-implemented method of claim 31, wherein [A] is a 4-point Discrete Cosine Transform (DCT) transformation matrix, [X] represents a time domain of a video signal, and [Y] represents a frequency domain of the video signal.

33.   (Previously Presented) The machine-implemented method of claim 32, wherein the multiplication matrix [M] is

$$
\begin{bmatrix}
\dfrac{1}{\sqrt{2}} & \dfrac{1}{\sqrt{2}} & 0 & 0 \\
\dfrac{1}{\sqrt{2}} & -\dfrac{1}{\sqrt{2}} & 0 & 0 \\
0 & 0 & \cos(\dfrac{3\pi}{8}) & \cos(\dfrac{\pi}{8}) \\
0 & 0 & -\cos(\dfrac{\pi}{8}) & \cos(\dfrac{3\pi}{8})
\end{bmatrix} ,
$$

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and wherein the positioned pairs are $\dfrac{\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}}$ and $\dfrac{\frac{1}{\sqrt{2}}}{-\frac{1}{\sqrt{2}}}$.

34.   (Previously Presented) A machine-readable medium having instructions to cause a machine to perform a machine-implemented method, comprising:

   receiving a multimedia signal having data values;

   forming the data values into a matrix of inputs [X];

   forming a matrix [A] of predetermined values and multiplication operations;

   factoring [A] into a butterfly matrix [B], a shuffle matrix [S], and a multiplication matrix [M], wherein the multiplication operations are selectively positioned into pairs within [M]; and

   executing a Single Instruction Multiple Data (SIMD) instruction that multiplies [X], [B], [S], and [M] together to obtain a matrix of outputs [Y].

35.   (Previously Presented) The machine-readable medium of claim 34, wherein the SIMD instruction is a Packed Multiply and Add (PMADDWD) instruction.

36.   (Previously Presented) The machine-readable medium of claim 35, wherein values within [B] and [S] are integers selected from the group consisting of 1, 0 and –1.

37.   (Previously Presented) The machine-readable medium of claim 36, wherein [A] is a 4-point Discrete Cosine Transform (DCT) transformation matrix, [X] represents a time domain of a video signal, and [Y] represents a frequency domain of the video signal.

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38.   (Previously Presented) The machine-readable medium of claim 37, wherein the multiplication matrix [M] is

$$\begin{bmatrix} \dfrac{1}{\sqrt{2}} & \dfrac{1}{\sqrt{2}} & 0 & 0 \\ \dfrac{1}{\sqrt{2}} & -\dfrac{1}{\sqrt{2}} & 0 & 0 \\ 0 & 0 & \cos(\dfrac{3\pi}{8}) & \cos(\dfrac{\pi}{8}) \\ 0 & 0 & -\cos(\dfrac{\pi}{8}) & \cos(\dfrac{3\pi}{8}) \end{bmatrix},$$

and wherein the positioned pairs are $\begin{matrix} \dfrac{1}{\sqrt{2}} \\ \dfrac{1}{\sqrt{2}} \end{matrix}$ and $\begin{matrix} \dfrac{1}{\sqrt{2}} \\ -\dfrac{1}{\sqrt{2}} \end{matrix}$.

39.   (Previously Presented) A system comprising:

a processing unit coupled to a memory through a bus; and

a process executed from the memory by the processing unit to cause the processing unit to:

receive a multimedia signal having data values;

form the data values into a matrix of inputs [X];

form a matrix [A] of predetermined values and multiplication operations;

factor [A] into a butterfly matrix [B], a shuffle matrix [S], and a multiplication matrix [M], wherein the multiplication operations are selectively positioned into pairs within [M]; and

execute a Single Instruction Multiple Data (SIMD) instruction that multiplies [X], [B], [S], and [M] together to obtain a matrix of outputs [Y].

40.   (Previously Presented) The system of claim 39, wherein the SIMD instruction is a Packed Multiply and Add (PMADDWD) instruction.

41.   (Previously Presented) The system of claim 40, wherein values within [B] and [S] are integers selected from the group consisting of 1, 0 and –1.

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42.   (Previously Presented) The system of claim 41, wherein [A] is a 4-point Discrete Cosine Transform (DCT) transformation matrix, [X] represents a time domain of a video signal, and [Y] represents a frequency domain of the video signal.

43.   (Previously Presented) The system of claim 42, wherein the multiplication matrix [M] is

$$\begin{bmatrix} \dfrac{1}{\sqrt{2}} & \dfrac{1}{\sqrt{2}} & 0 & 0 \\ \dfrac{1}{\sqrt{2}} & -\dfrac{1}{\sqrt{2}} & 0 & 0 \\ 0 & 0 & \cos(\dfrac{3\pi}{8}) & \cos(\dfrac{\pi}{8}) \\ 0 & 0 & -\cos(\dfrac{\pi}{8}) & \cos(\dfrac{3\pi}{8}) \end{bmatrix},$$

and wherein the positioned pairs are $\begin{matrix} \dfrac{1}{\sqrt{2}} \\ \dfrac{1}{\sqrt{2}} \end{matrix}$ and $\begin{matrix} \dfrac{1}{\sqrt{2}} \\ -\dfrac{1}{\sqrt{2}} \end{matrix}$.

44.   (New) The method of claim 29, wherein the butterfly matrix [B] is of the form

$$\begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & -1 & 0 \\ 1 & 0 & 0 & -1 \end{bmatrix}.$$

45.   (New) The machine-readable medium of claim 36, wherein the butterfly matrix [B] is of the form

$$\begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & -1 & 0 \\ 1 & 0 & 0 & -1 \end{bmatrix}.$$

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46.   (New) The system of claim 41, wherein the butterfly matrix [B] is of the form

$$\begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & -1 & 0 \\ 1 & 0 & 0 & -1 \end{bmatrix}.$$

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